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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER
PATEL, ASHOKKUMAR B

ART UNIT	PAPER NUMBER
2154	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2005*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-20 are subject to examination.

Continued Examination Under 37 CFR 1.114

2.   A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/19/2005 has been entered.

Response to Arguments

3.   Applicant's arguments filed 09/19/2005 have been fully considered but they are not persuasive for the following reasons:

Applicant's argument:

"Presently pending independent claims 1, 9 and 13 have each been amended to explicitly recite that the distributed system includes a plurality (e.g., more than one) of processes currently operational therein, whereby a probationary process is set up by in the system by establishing a respective communications path with each of the other processes in the system. Then, at least one criterion for promoting the probationary member to a 111 member is evaluated, based on information obtained from the probationary member on the plurality of communication paths."

In Badovinatz, on the other hand, as clearly shown in Figure 12 of that reference and as described in column 14 of that reference, a new process first must initiate a

request to join to one entity, that being the Group Leader, whereby the new request is prescreened by the Group Leader in step 1216. In that regard, even if the new request could be considered to be a probationary process prior to and during step 1216, that new request does not communicate with all other existing processes, but rather it communicates only with the Group Leader, which is the sole entity that prescreens the new request."

Examiner's response:

Badovinatz teaches in col. 5, line 47-62, "<u>In order to **become a member of a**</u> <u>processor group, a processor needs to request **to be a member of that group.**</u> In **accordance with the principles of the present invention, a processor requests** to become **a member of a particular processor group** (e.g., Processor Group X) when **a** **process related to that group (e.g., Process X) requests to join a corresponding** **process group (e.g., Process Group X)** and the processor is not aware of that corresponding process group.   Since the Group Services daemon on the processor handling the request to join a particular process group is not aware of the process group, it knows that it is not a member of the corresponding processor group. **Thus,** **the processor asks to become a member, so that the process can become a** **member of the process group.** (One technique for becoming a member of a processor group is described in detail further below.)"

Further, Badovinatz teaches in col. 6, line 1-11, "In accordance with the principles of the present invention, **a group leader is selected** for **each processor** **group** of the network.   In one example, the group leader is the first processor

requesting to join a particular group.   As described herein, **the group leader is responsible for controlling activities associated with its processor group(s).** For example, if a processing node, Node 2 (FIG. 4), is the first node to request to join Processor Group X, then Processing Node 2 is the group leader and is responsible for managing the activities of Processor Group X. **It is possible for Processing Node 2 to be the group leader of multiple processor groups."**

FIG. 4
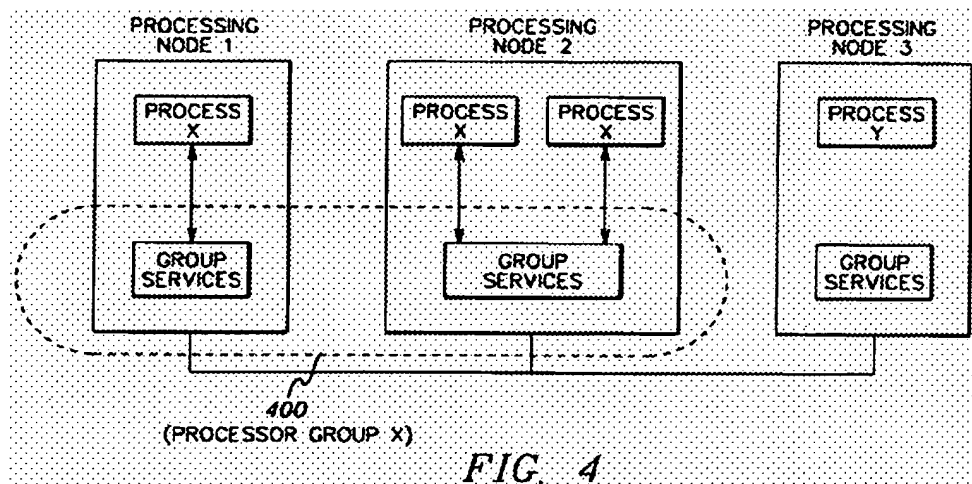
Now let us examine the above figure with respect to it's own description spelled out in col. 5, line 31-46," The internal layer of Group Services implements functions on a per processor group basis.   There may be a plurality of processor groups in the network. Each processor group (also, referred to as a metagroup) includes one or more processors having a Group Services daemon executing thereon. **The processors of a particular group are related in that they are executing related processes.** (In one example, processes that are related provide a common function.) For example, referring to FIG. 4, a Processor Group X (400) includes Processing Node 1 and Processing Node 2, since each of these nodes is executing a process X, but it does not include

Processing Node 3. Thus, Processing Nodes 1 and 2 are members of Processor Group

X. **A processing node can be a member of none or any number of processor**

groups, and processor groups can have one or more members in common. "

Badovinatz also teaches in col. 13, line 62 through col. 14, line 11," In

accordance with the principles of the present invention, **the first process to join a**

process group identifies a set of attributes for the group. These attributes are

included as arguments in the join call sent by the process. These attributes include, for

instance, the group name, which is a unique identifier, and prespecified information that

defines to Group Services how the group wishes to manage various protocols. For

instance, the attributes can include an indication of whether the process group will

accept batched requests, as described below. Additionally, in another example, the

attributes can include a client version number representing, for example, the software

level of the programming in each provider. This will ensure that all group members are

at the same level. The above-described attributes are only one example. Additional or

different attributes can be included without departing from the spirit of the claimed

invention."

Thus, Badovinatz's a processing node such as one shown in Fig. 4 is the

selected group leader where the node can be by itself, wherein the node does

incorporate **Process X and Process X and Process X and so on, and further as**

clearly stated above by Badovinatz that "**It is possible for Processing Node 2 to be**

the group leader of multiple processor groups." Additionally, the group attributes

are determined as stated by Badovinatz; "**the first process to join a process group**

identifies a set of attributes for the group.   As such, the "group leader" is a

conglomerate of processes.

Thus the new request is being communicated with all other existing processes by

establishing a plurality of communication paths for evaluating the new request for

promoting it to be full member.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed
> publication in this or a foreign country or in public use or on sale in this country, more than one year prior to
> the date of application for patent in the United States.

5.   Claims 1-3, 6-10, 13-15 and 18-20 are rejected under 35 U.S.C. 102(b) as being

anticipated by Badovinatz et al. (hereinafter Badovinatz) (US 6,016,505).

Referring to claim 1,

The reference teaches a method of performing one or more of adding and removing a

process in a distributed system having a plurality of processes currently operational

therein (col.13, lines 37 through col.15, line 18), said method comprising steps of:

(1) launching a probationary member in said distributed system (col.13, lines 39-42);

(2) establishing a plurality of communication paths between said probationary member

and each of said plurality of processes, respectively, in said system (col.14, lines 15-16

"SEND JOIN REQUEST TO GROUP LEADER", col. 13, line 62 through col. 14, line 11,

col. 5, line 47-62, col. 5, line 31-46, col. 6, line 1-11, Badovinatz's a processing node

such as one shown in Fig. 4 is the selected group leader where the node can be by

itself, wherein the node does incorporate **Process X and Process X and Process X**

and so on, and further as clearly stated above by Badovinatz that "**It is possible for Processing Node 2 to be the group leader of multiple processor groups.**" Additionally, the group attributes are determined as stated by Badovinatz; "**the first process to join a process group identifies a set of attributes for the group.** As such, the "group leader" is a <u>conglomerate of processes.</u>);

(3) evaluating at least one criterion for promoting said probationary member to a full member , based on information obtained from said probationary member by said each of said plurality of processes on said plurality of communication paths; and (4) performing one of promoting said probationary member to a full member and eliminating said probationary member based on the evaluation performed in step (3). (col.14, lines 16-21, "The group leader then performs a prescreening test, STEP 1216 "PRESCREEN." In particular, the group leader determines whether the attributes specified by the requesting process are the same as the attributes set by the first process of the group. If not, then the join request is rejected.", Fig.12, elements 1218-1224,)

Referring to claim 2,

The reference teaches the method of claim 1, wherein step (3) further comprises a step of: determining whether said at least one criterion is satisfied. (Fig.12, element 1216, element 1218)

Referring to claim 3,

The reference teaches the method of claim 2, wherein said step (4) further comprises steps of: promoting said probationary member to said full member in response to said at

least one criterion being satisfied; and eliminating said probationary member in

response to said at least one criterion not being satisfied. (Fig. 12, element 1216,

col.14, lines 17-21, "In particular, the group leader determines whether the attributes

specified by the requesting process are the same as the attributes set by the first

process of the group. If not, then the join request is rejected.")

Referring to claims 6 and 7,

The reference teaches the method of claim 1, wherein said probationary member is

replacing a first process in said system and step (4) further comprises a step of:

replacing said first process and promoting said probationary member to said full

member in a single view change. (The reference Badovinatz teaches in col. 16, lines

49-51, "For example, when a member joins or leaves the group, the group is driven

through a multi-step protocol, as described above. During each voting step, the group

members perform local actions to prepare for the new member, or to recover from the

loss of the failed member." (a step of determining whether said probationary member is

replacing a member in said system.) The reference also teaches in col. 11, lines 36-40,

"Thus, if a request to remove a member due to a failure is proposed at the same time as

a request to join and a request to leave, then the request to remove is selected first.

Then, the request to join is selected, followed by the request to leave."; and col.15, lines

19-24," Likewise, in one embodiment, the technique for removing a process when the

process fails or when the processor executing the process fails, is similar to that

technique used to remove a process requesting to leave. However, instead of the

process initiating a request to leave, the request is initiated by Group Services." Thus

the reference teaches replacing the process and promoting the joining member process occurs before the request to leave is processed. Thus the replacement occurs in a single view change (following the sequence as indicated above, first join and then remove) and thus the reference teaches the method that provides mechanism for maintaining fault tolerance during step of replacing first process and promoting probationary member.)

Referring to claim 8,

The reference teaches the method of claim 7, wherein said at least one criterion is related to context information. (col.14, lines 12-27, "In particular, the group leader determines whether the attributes specified by the requesting process are the same as the attributes set by the first process of the group. If not, then the join request is rejected." Fig.12,element 1204)

Referring to claim 9,

The reference teaches a distributed system including a plurality of processes in communication with each other, said distributed system (Fig.10) comprising: a first host capable of executing a first process of said plurality of processes (Fig.10, processor 1, process X) ; a second host capable of executing a second process of said plurality of processes(Fig.10, processor 2, process X); a third host capable of executing a third process of said plurality of processes (col. 5, line 31-46); a first communication path connecting said first and second host, a second communication path connecting said first and third hosts and third communication path connecting said second and third hosts; (Fig.10, element 1000, col. 6, line 1-11) ; wherein said second process is a

probationary member evaluated using at least one criterion for promoting said probationary member to a full member; and said probationary member being either promoted to a full member or eliminated based on the evaluation using said at least one criterion for promoting said probationary member to a full member, said at least one criterion being obtained based on information output by said second host that is received on said first and third communication paths by said first and third hosts (col.10, lines 56-67 and col.14, lines 16-21, "The group leader then performs a prescreening test, STEP 1216 "PRESCREEN." In particular, the group leader determines whether the attributes specified by the requesting process are the same as the attributes set by the first process of the group. If not, then the join request is rejected.", Fig.12, elements 1218-1224, col. 13, line 62 through col. 14, line 11, col. 5, line 47-62, col. 5, line 31-46, col. 6, line 1-11, Badovinatz's a processing node such as one shown in Fig. 4 is the selected group leader where the node can be by itself, wherein the node does incorporate **Process X and Process X and Process X and so on, and further as clearly stated above by** Badovinatz that "**It is possible for Processing Node 2 to be the group leader of multiple processor groups."** Additionally, the group attributes are determined as stated by Badovinatz; "**the first process to join a process group identifies a set of attributes for the group.** As such, the "group leader" is a conglomerate of processes.).

Referring to claim 10,

The reference teaches the distributed system of claim 9, wherein said system is operable to promote said probationary member to said full member in response to said

at least one criterion being satisfied; and said system is operable to eliminate said probationary member in response to said at least one criterion not being satisfied. (Fig. 12, element 1216, col.14, lines 17-21, "In particular, the group leader determines whether the attributes specified by the requesting process are the same as the attributes set by the first process of the group. If not, then the join request is rejected.")

Referring to claim 13,

Claim 13 is a claim to computer readable medium on which is embedded a program, the program executing a method of claim 1. Therefore, claim 13 is rejected for the reasons set forth for claim 1.

Referring to claim 14,

Claim 14 is a claim to computer readable medium on which is embedded a program, the program executing a method of claim 2. Therefore, claim 14 is rejected for the reasons set forth for claim 2.

Referring to claim 15,

Claim 15 is a claim to computer readable medium on which is embedded a program, the program executing a method of claim 3. Therefore, claim 15 is rejected for the reasons set forth for claim 3.

Referring to claims 18 and 19,

Claims 18 and 19 are claims to computer readable medium on which is embedded a program, the program executing a method of claims 6 and 7. Therefore, Claims 18 and 19 are rejected for the reasons set forth for claims 6 and 7.

Referring to claim 20,

Claim 20 is a claim to computer readable medium on which is embedded a program, the

program executing a method of claim 8. Therefore, claim 20 is rejected for the reasons

set forth for claim 8.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such
> that the subject matter as a whole would have been obvious at the time the invention was made to a person having
> ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in
> which the invention was made.

7.   Claims 4, 5, 11, 12, 16 and 17 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Badovinatz et al. (hereinafter Badovinatz) (US 6,016,505) in view of

Kidder et al. (US 6, 694, 450 B1)

Referring to claims 4 and 5,

The reference Badovinatz teaches in col.13, lines 5-8, "Additionally, the mechanisms of

the present invention mediate changes to the group state value, and guarantee that it

remains consistent and reliable, as long as at least one process group member

remains.", (Thus the group can only have members whose state is being the group

state value which is transferred to the joining member (probationary member)) and

col.16, lines 51-60) (performing a state transfer in response to said probationary

member). The reference Badovinatz teaches in col. 16, lines 49-51, "For example, when

a member joins or leaves the group, the group is driven through a multi-step protocol,

as described above. During each voting step, the group members perform local actions

to prepare for the new member, or to recover from the loss of the failed member." (a step of determining whether said probationary member is replacing a member in said system.) However, the reference fails to teach that the member joining the group is a mirror. The reference Kidder teaches a system of processes that communicate (col.19, lines 29-37) and creation of mirror process and initiating an audit process to synchronize retrieved state with dynamic state of associated other processes. (Abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to enhance the system of Badovinatz by including the teachings of Kidder wherein the mirror is created and introduced to the group of processes by vote value at each of the one or more synchronization phases to indicate whether the protocol is to proceed to another synchronization phase. The barrier synchronization technique taught by Badovinatz ensures that all members of the group have reached each synchronization point within the protocol before proceeding.

Referring to claims 11 and 12,

The reference Badovinatz teaches in col. 16, lines 49-51, "For example, when a member joins or leaves the group, the group is driven through a multi-step protocol, as described above. During each voting step, the group members perform local actions to prepare for the new member, or to recover from the loss of the failed member." (probationary member is replacing a member). The reference also teaches in col. 11, lines 36-40, "Thus, if a request to remove a member due to a failure is proposed at the same time as a request to join and a request to leave, then the request to remove is selected first. Then, the request to join is selected, followed by the request to leave.";

and col.15, lines 19-24," Likewise, in one embodiment, the technique for removing a process when the process fails or when the processor executing the process fails, is similar to that technique used to remove a process requesting to leave. However, instead of the process initiating a request to leave, the request is initiated by Group Services." Thus the reference teaches replacing the process and promoting the joining member process occurs before the request to leave is processed. Thus the replacement occurs wherein said fault tolerant unit is operable to maintain fault tolerance (following the sequence as indicated above, first join and then remove) and thus the reference teaches the method that provides mechanism for maintaining fault tolerance during step of replacing the process and promoting probationary member. Additionally in col. 13, line 62 through col. 14, line 11, col. 5, line 47-62, col. 5, line 31-46, col. 6, line 1-11, Badovinatz's a processing node such as one shown in Fig. 4 is the selected group leader where the node can be by itself, wherein the node does incorporate **Process X and Process X and Process X and so on, and further as clearly stated above by** Badovinatz that "**It is possible for Processing Node 2 to be the group leader of multiple processor groups."** Additionally, the group attributes are determined as stated by Badovinatz; "**the first process to join a process group identifies a set of attributes for the group.** As such, the "group leader" is a conglomerate of processes.)

The reference fails to teach the process group as being the group of processes including the mirror processes.

The reference Kidder teaches the mirror designs (redundancy designs as well as fault tolerant system) in col.39 line 55 through col.40, line 67). The reference Kidder teaches a system of processes that communicate (col.19, lines 29-37). Thus the references discloses "a third process; and a fourth process; said third and fourth processes being in communication with each of said processes in said system via multiple communication paths; wherein said first, third and fourth processes are a fault tolerant unit in said system; at least two of said first, third and fourth processes are mirrors." Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to enhance the system of Badovinatz by including the teachings of Kidder wherein the mirror is created and introduced to the group of processes by vote value at each of the one or more synchronization phases to indicate whether the protocol is to proceed to another synchronization phase. The barrier synchronization technique taught by Badovinatz ensures that all members of the group have reached each synchronization point within the protocol before proceeding.

Referring to claim 16,

Claim 16 is a claim to computer readable medium on which is embedded a program, the program executing a method of claim 4. Therefore, claim 16 is rejected for the reasons set forth for claim 4.

Referring to claim 17,

Claim 17 is a claim to computer readable medium on which is embedded a program, the program executing a method of claim 5. Therefore, claim 17 is rejected for the reasons set forth for claim 5.

Conclusion

Examiner's note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashok B. Patel whose telephone number is (571) 272-3972. The examiner can normally be reached on 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A. Follansbee can be reached on (571) 272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

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